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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/811,739	03/29/2004	James Owens	200315990-1	1675

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INTELLECTUAL PROPERTY ADMINISTRATION
FORT COLLINS, CO 80527-2400

EXAMINER

HUNG, YUBIN

ART UNIT	PAPER NUMBER
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2624

MAIL DATE	DELIVERY MODE
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06/21/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/811,739

Applicant(s)

OWENS ET AL.

Examiner

Yubin Hung

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 2, 4, 5, 8, 9, 16, 19, 20 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Kato (US 6,259,816).

3. Regarding claim 1, and similarly claims 16 and 21, Kato discloses

- an imaging subsystem for capturing video frames
[Ref. 11 of Figs. 1 & 7]
- a motion sensor for detecting movement of said device
[Ref. 15 of Figs. 1 & 7; Col. 4, lines 3-12. Note that the altitude control signal causes the camera to be moved. Since the altitude controller 15 generates and transmits the control signal, it is considered a motion sensor (since it knows the amount of the camera movement)]
- encoding logic for encoding video frames from said imaging subsystem according to a motion compensation compression algorithm, wherein said encoding logic determines motion vectors by displacing interframe search areas using information from said motion sensor
[Fig. 1, refs. 13 & 14 (together considered as the encoding logic with detail of ref. 13 shown in Fig. 7, ref. 131); Fig. 5 (displacement of search area); Fig. 7 (motion-compensated compression); Col. 3, lines 49-56; Col. 5, lines 1-12]

4. Regarding claim 2, and similarly claim 19, Kato further discloses

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- wherein said motion sensor generates information indicative of angular translation
[Fig. 4; Col. 3, 43-48; Col. 4, lines 54-67. Note that the camera motion (rotating about the first axis to change altitude) is an angular translation]

5. Regarding claim 4, and similarly claim 20, Kato further discloses

- wherein said encoding logic implements a function that calculates an estimated interframe pixel displacement using information generated by said motion sensor
[Fig. 1, refs. 13 & 14 (the encoding logic) and 15 (motion sensor); Fig. 5 (displaced search area); Col. 5, lines 1-4]

6. Regarding claim 5, Kato further discloses

- wherein said function is a linear function
[Fig. 5 and Col. 5, lines 1-4. Note that the displacement as shown is linear]

7. Regarding claim 8, Kato discloses

- receiving at least first and second video frames
[Ref. 11 of Figs. 1 & 7]
- receiving motion information related to a movement of said device from at least one motion sensor
[Ref. 15 of Figs. 1 & 7; Col. 4, lines 3-12. Note that the altitude control signal causes the camera to be moved. Since the altitude controller 15 generates and transmits the control signal, it is considered a motion sensor (since it knows the amount of the camera movement)]
- selecting a reference block of pixels within said second frame
[Fig. 5, ref. P3 (reference block)]
- selecting a search area within said first frame, wherein said search area is displaced from a position defined by said selected reference block using said motion information
[Fig. 4; Fig. 5, ref. "Next search area;" Col. 5, lines 1-12]
- determining an interframe motion vector by comparing said reference block of pixels within said second frame to pixels within said search area of said first frame
[Fig. 5; Col. 5, lines 5-12]

8. Regarding claim 9, Kato further discloses

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- determining a displacement vector from said motion information and originating at a position in said first frame associated with said reference block's position in said second frame, wherein said selecting said search area employs said displacement vector to locate said search area
[Fig. 5; Col. 5, lines 1-12]

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 6 and 7 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Kato (US 6,259,816) as applied to claims 1, 2, 4, 5, 8, 9, 16, 19, 20 and 21 above.

11. Regarding claims 6 and 7, Kato discloses all limitations of its parent, claim 4. In addition, official notice is taken that implementation of encoding logic in either ASIC (claim 6) or software instruction (claim 7) are both well known in the art, the former would usually be for improved speed and the latter for flexibility and ease of modification; the selection of either would clearly have been a design choice since both can accomplish the task of encoding the images.

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12. Claims 3, 10-13, 17, 18 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Kato (US 6,259,816) as applied to claims 1, 2, 4-9, 16, 19 and 20 above, and further in view of Lee (US 2003/0058347).

13. Regarding claim 3, and similarly claim 18, Kato discloses all limitations of its parent, claim 1.

Kato does not disclose the following, which is taught by Lee:

- wherein said motion sensor generates information indicative of linear displacement
[Fig. 3 (camera motion, including rotations and linear translations); Fig. 17 (various state signals, including camera movement); Fig. 18, "camera movement sensing means;" P. 3, paragraph 39; PP. 6-7, paragraph 61]

Kato and Lee are combinable because they both have aspects that are from the same field of endeavor of image compression.

At the time of the invention it would have been obvious to one of ordinary skill in the art to modify Kato with the teachings of Lee by also having the camera move in a linear fashion (in addition to rotation) and generate information indicative of linear displacement. The motivation would have been to be able to record a scene from different view angles (thus the linear motion of the camera) and to provide such information to the encoding unit for efficient video compression, as Lee indicates in P. 2, paragraph 10.

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Therefore it would have been obvious to combine Lee with Kato to obtain the invention as specified in claim 3.

14. Regarding claims 10, 12, 13 and 17, Lee further discloses using a gyroscopic sensor (claim 10) or an accelerometer (claims 12, 13 and 17) to detect camera motion [P. 3, paragraph 38, especially the last 4 lines] for accuracy as well as to be able to operate in door (which GPS-based systems sometimes fail). Note that the operating principle of the accelerometer recited in claim 13 is well known in the art.

15. Regarding claim 11, Kato further discloses

- calculating a displacement vector by employing a small angle approximation for a function that receives information indicative of angular displacement using said gyroscopic sensor [Fig. 4 (angular displacement); Fig. 5, "Motion Vector" (the motion vector is shown as a displacement vector) and Col. 5, lines 1-4. Note that approximating a small angular displacement as a linear approximation to simplify the computation is well known to one of ordinary skill in the art]

16. Claims 14 and 15 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Kato (US 6,259,816) and Lee (US 2003/0058347) as applied to claims 3, 10-13, 17, 18 above, and further in view of Allen (US 2003/0058347).

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17. Regarding claims 14 and 15, the combined invention of Kato and Lee discloses all limitations of their parent, claim 12.

The combined invention of Kato and Lee does not disclose the following, which is taught by Lee:

(claim 14) wherein a plurality of accelerometers generate said motion information, wherein said plurality of accelerometers provide at least one differential signal that is indicative of angular translation of said image capture device

[Fig. 2, refs. 34-36 and Col. 4, line 66-Col. 5, line 2]

(claim 15) wherein a plurality of accelerometers are disposed within said image capture device in respective Cartesian planes

[Fig. 2, refs. 34-36 and Col. 4, line 66-Col. 5, line 2]

The combined invention of Kato and Lee is combinable with Allen because they both have aspects that are from the same field of endeavor of image compression.

At the time of the invention it would have been obvious to one of ordinary skill in the art to modify the combined invention of Kato and Lee with the teachings of Allen as recited in either claims 14 or 15. The motivation would have been to stabilize the recorded scenes as well as to predict the frame-to-frame global motion as a precursor to video compression, as Allen indicates in Col. 3, lines 32-35.

Therefore it would have been obvious to combine Allen with Kato and Lee to obtain the inventions as specified in claims 14 and 15.

Conclusion and Contact Information

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- Lennon (US 6,711,590) – discloses using gyroscopes or accelerometer to detect camera motion [Col. 7, line 66-Col. 7, line 2]
- Takahashi (US 7,218,675) – discloses using shaking/panning sensor to detect camera movement for correction [Fig. 1, refs. 5 & 12]
- Hansen et al. (US 6,211,913) – discloses using accelerometer to help stabilizing images [Fig. 6, ref. 612; Col. 11, lines 56-64]
- Kaplan (US 5,734,371) – discloses using accelerometers that provide differential of voltage [Fig. 2, refs. 201, 202; Col. 4, lines 7-19]
- Grieff et al. (US 5,473,945) – discloses using both angular and linear accelerometers [Fig. 10; Col. 9, lines 32-38]

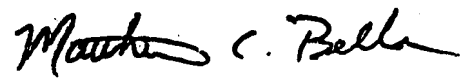
19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yubin Hung whose telephone number is (571) 272-7451. The examiner can normally be reached on 7:30 - 4:00. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew C. Bella

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can be reached on (571) 272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

20. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Yubin Hung
Patent Examiner
Art Unit 2624
June 12, 2007


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